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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,119	04/01/2004	Stephen D. Julstrom	12624US06	8489

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MCANDREWS HELD & MALLOY, LTD  
500 WEST MADISON STREET  
SUITE 3400  
CHICAGO, IL 60661

EXAMINER

ENSEY, BRIAN

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



**Office Action Summary**

Application No.

10/816,119

Applicant(s)

JULSTROM ET AL.

Examiner

Brian Ensey

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 and 36-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41-47 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8, 10, 16-18 and 36-40 is/are rejected.
- 7) ☒ Claim(s) 4, 9 and 11-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |



## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 17, 18 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Widow U.S. Patent No. 5,737,430 in view of Jacobs et al. U.S. Patent No. 6,516,075.

Regarding claim 1, Widrow discloses a hearing improvement device comprising: a microphone (3-7) for transducing a sound field into a first electrical signal; an amplifier (21) for amplifying the first electrical signal into a second electrical signal; and at least one inductor (22) for converting the second electrical signal into a magnetic field for coupling to at least one telecoil of a hearing aid (12), wherein the microphone is amplified and coupled through the at least one inductor to the hearing aid (See Fig 2, col. 2, lines 59-65 and col. 3, lines 14-24).

Widrow does not expressly disclose said at least one inductor comprises a plurality of coils. However, the use of multiple coils in a single inductive element is well-known in the art and Jacobs teaches a hearing improvement device comprising at least one inductor (12) and further comprising a plurality of coils (12A and 12B) (See Fig. 5 and col. 3, lines 37-44). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the inductive element of Widrow with the multicoil inductive element of Jacobs to vary the transmission range of the hearing improvement device (See Jacobs col. 3, lines 42-44).



Regarding claim 2, the combination of Widrow in view of Jacobs further discloses the hearing aid comprises at least one of the following: a behind-the ear (BTE) hearing, an in-the-ear (ITE) hearing aid, an in-the-canal (ITC) hearing aid, and a completely-in-the-canal(CIC) hearing aid (See Widrow col. 3, line 26).

Regarding claim 3, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs further discloses the filtering the first electrical signal; and amplifying the filtered first electrical signal, producing the second electrical signal (See Fig. 2 and col. 3, lines 15-30). The combination of Widrow in view of Jacobs further teaches a band pass filter to limit the signal to the audio band. The combination of Widrow in view of Jacobs does not expressly disclose said filter is a high pass filter being used to reduce low-frequency components of an electrical signal and avoid excessive low-frequency coupling to the hearing aid. However, high pass filters are well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to use a high pass filter to limit the low frequency signals and avoid excessive low-frequency coupling to the hearing aid.

Regarding claim 17, the combination of Widrow in view of Jacobs further discloses the hearing aid is one of connected via a wired connection to the hearing improvement device and connected wirelessly to the bearing improvement device (See Widrow col. 3, lines 21-30).

Regarding claim 18, the combination of Widrow in view of Jacobs further discloses the hearing improvement device is adapted to connect to one of one earphone and two earphones (See Widrow col. 3, line 26, output could drive headphones).



Regarding claim 36, Widrow discloses a method for processing signals, the method comprising: transducing a sound field into a first electrical signal (3-7); amplifying the first electrical signal into a second electrical signal (21); and converting the second electrical signal into a magnetic field (22) for coupling to at least one telecoil of a hearing aid (12) (See Fig 2, col. 2, lines 59-65 and col. 3, lines 14-24). Widrow does not expressly disclose said converting is performed via a plurality of coils. However, the use of multiple coils in a single inductive element is well-known in the art and Jacobs teaches a hearing improvement device comprising at least one inductor (12) and further comprising a plurality of coils (12A and 12B) (See Fig. 5 and col. 3, lines 37-44). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the inductive element of Widrow with the multicoil inductive element of Jacobs to vary the transmission range of the hearing improvement device (See Jacobs col. 3, lines 42-44).

Regarding claim 37, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs further discloses filtering the first electrical signal prior to amplifying (See Widrow Fig. 2, Although the first electrical passes through some preamps, the combined input signal is filtered by filter (20) prior to being amplified by the power amp (21) which provides the second electrical signal). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the first electrical signal (the combined signal from all the microphones) is filtered before amplifying.

Regarding claim 38, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs further discloses



the filtering the first electrical signal; and amplifying the filtered first electrical signal, producing the second electrical signal (See Widrow Fig. 2 and col. 3, lines 15-30). The combination of Widrow in view of Jacobs further teaches a band pass filter to limit the signal to the audio band. The combination of Widrow in view of Jacobs does not expressly disclose said filter is a high pass filter being used to reduce low-frequency components of an electrical signal and avoid excessive low-frequency coupling to the hearing aid. However, high pass filters are well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to use a high pass filter to limit the low frequency signals and avoid excessive low-frequency coupling to the hearing aid.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Widrow in view of Jacobs and further in view of Valente Hearing Aids: Standards, Options, and Limitations 1996.

Regarding claim 5, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs further discloses the output frequency band comprises the 1 kHz band in the audio range of human speech (See Widrow col. 3, lines 17-21). The combination of Widrow in view of Jacobs does not expressly disclose the magnetic field emanating from the hearing improvement device comprise approximately 30 mA/meter at 1 kHz, wherein 1 kHz lies in range of frequencies comprising human speech. However, it is well known in the art that a magnetic field emanating comprises approximately 30 mA/meter at 1 kHz for effectively coupling from a neck loop to a hearing aid (See Valente pg 50, lines 4-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the combination of Widrow in view of Jacobs provides an



output of approximately 30 mA/meter at 1 kHz to meet the standard set by IEC-118-1 to provide for sufficient signal strength for proper operation.

Claims 6, 7, 8, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Widrow in view of Jacobs in further view of Crouch et al. U.S. Patent No. 6,320,959.

Regarding claims 6 and 16, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs does not expressly disclose the hearing improvement device is positioned adjacent to the hearing aid, the hearing improvement device being located behind an ear and next to the head of a user providing coupling of a magnetic field generated by a transmit inductor coil within the hearing improvement device to a receiving telecoil located within the hearing aid having uniform magnetic coupling strength over a range of telecoil positions within the hearing aid. However, Crouch teaches the inductor coil (38) of a hearing improvement device is positioned adjacent to the hearing aid, the hearing improvement device being located behind an ear and next to the head of a user providing coupling of a magnetic field generated by a transmit inductor coil within the hearing improvement device to a receiving telecoil located within the hearing aid having uniform magnetic coupling strength over a range of telecoil positions within the hearing aid (See Crouch Fig 1 and col. 3, line 51 to col. 4, line 34). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the neck loop inductor of the combination of Widrow in view of Jacobs with the ear mounted coil of Crouch for greatly improved clarity (See Crouch col. 2, lines 59-64).

Regarding claim 7, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs does not



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expressly disclose the hearing improvement device comprises a behind-the-ear (BTE) transmit inductor positioned to magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid wherein lines of magnetic flux generated by the BTE transmit inductor are arranged primarily vertically in a region within which the ITE hearing aid is located to optimize interaction with the vertically oriented telecoil located within the ITE hearing aid. However, Crouch teaches a behind-the-ear (BTE) transmit inductor (64) positioned to magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid (Widrow, item 12), wherein lines of magnetic flux generated by the BTE transmit inductor are arranged primarily vertically in a region within which the ITE hearing aid is located to optimize interaction with the vertically oriented telecoil located within the ITE hearing aid (See Crouch Figs. 2, 5 and 6 and col. 4, lines 5-34). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the neck loop inductor of the combination of Widrow in view of Jacobs with the ear mounted coil of Crouch for greatly improved clarity and efficient coupling (See Crouch col. 2, lines 59-64).

Regarding claim 8, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs does not expressly disclose the at least one inductor comprises a behind-the-ear (BTE) transmit inductor positioned to magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid and wherein field strength the BTE transmit inductor is maximized by providing a core of the BTE transmit inductor being sized to be contained within a limitation of space and orientation available behind a user's outer ear or between the user's outer ear and the user's head. However, Crouch teaches a behind-the-ear (BTE) transmit inductor (64) positioned to



magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid (Widrow, item 12), wherein field strength the BTE transmit inductor is maximized by providing a core of the BTE transmit inductor being sized to be contained within a limitation of space and orientation (Coil 64 takes up the maximum space available in the BTE housing) available behind a user's outer ear or between the user's outer ear and the user's head (See Crouch Figs. 4 and 6, col. 4, lines 5-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the neck loop inductor of the combination of Widrow in view of Jacobs with the ear mounted coil of Crouch for greatly improved clarity and efficient coupling (See Crouch col. 2, lines 59-64).

Regarding claim 10, the combination of Widrow in view of Jacobs discloses a hearing improvement device as claimed. The combination of Widrow in view of Jacobs does not expressly disclose the hearing improvement device comprises a behind-the-ear (BTE) transmit inductor positioned to magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid wherein the BTE transmit inductor comprises a coil, the coil comprising windings, wherein the windings of the BTE transmit inductor are used for coupling to an ITE hearing aid. However, Crouch teaches a behind-the-ear (BTE) transmit inductor (64) positioned to magnetically couple with a vertically-oriented telecoil located within an ITE hearing aid (Widrow, item 12), wherein lines of magnetic flux generated by the BTE transmit inductor are arranged primarily vertically in a region within which the ITE hearing aid is located to optimize interaction with the vertically oriented telecoil located within the ITE hearing aid (See Crouch Figs. 2, 5 and 6 and col. 4, lines 5-34). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the neck loop inductor of the combination of



Widrow in view of Jacobs with the ear mounted coil of Crouch for greatly improved clarity and efficient coupling (See Crouch col. 2, lines 59-64).

Claims 39 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Hall U.S. Patent No. 6,307,945 in view of Jacobs.

Regarding claim 39, Hall discloses a hearing improvement device (4) comprising: a selector (15) that enables selection of at least one of the following; a first sound field (sound field from microphone on unit 4) and a second sound field (sound field from microphone 2 on unit1); a microphone (14) for transducing the selected sound field into a first electrical signal; an amplifier for amplifying the first electrical signal into a second electrical signal; and at least one inductor (7) for converting the second electrical signal into a magnetic field for coupling to at least one telecoil of a hearing aid (8), wherein the microphone is amplified and coupled through the at least one inductor to the hearing aid (See Figs. 1 and 2 and col. 4, lines 43 to col. 5, line 14). Hall does not expressly disclose said at least one inductor comprises a plurality of coils. However, the use of multiple coils in a single inductive element is well-known in the art and Jacobs teaches a hearing improvement device comprising at least one inductor (12) and further comprising a plurality of coils (12A and 12B) (See Fig. 5 and col. 3, lines 37-44). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the inductive element of Hall with the multicoil inductive element of Jacobs to vary the transmission range of the hearing improvement device (See Jacobs col. 3, lines 42-44).

Regarding claim 40, the combination of Hall in view of Jacobs further discloses the selector (user operating switch 15 ) selects the first sound field of the second sound field based



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on signal strength of the first sound field and the second sound field (See Hall col. 4, lines 59-65).

***Allowable Subject Matter***

Claims 41-47 are allowed.

Claims 4, 9 and 11-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

The Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group **Art Unit 2615**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 571-272-7496. The examiner can normally be reached on Monday - Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

**Any response to this action should be mailed to:**

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Art Unit: 2615

Alexandria, Va. 22313-1450

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(571) 273-8300, for formal communications intended for entry and for informal or draft communications, please label "PROPOSED" or "DRAFT".

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Brian Ensey  
Examiner

September 18, 2006